

Specific Changes to Claims Shown on Attached Pages.

The specific changes to the amended claims are shown on a separate set of pages attached hereto and entitled **VERSION WITH MARKINGS TO SHOW CHANGES MADE**, which follows the signature page of this Amendment.

All Claims Are Currently Allowable

The Examiner rejected Claims 38-43 under 35 U.S.C. §§ 102(b) and 103(a) as unpatentable over U.S. Patent No. 5,746,497 to Machida. Claim 38 has been amended, and Applicants respectfully contend that Claims 38-43 currently define over Machida.

Machida discloses an automotive signal lamp 1 comprising a lamp body 4 upon which a lens 2 is disposed, thus defining an enclosed lamp chamber 5. The body 4 comprises a base plate 4a and a vertical wall 4b. A few groups 8 of LEDs are arranged on the base plate 4a within the lamp chamber 5. Conductive plus and minus connectors 10, 11 are positioned on the upper surface of the base plate 4a to supply electrical current to the LEDs. As such, *the base plate 4a must not be made of a conductive material*. The connectors 10, 11 are held onto the base plate 4a using caulk. (see col. 5, ll.43-50).

An important advantage reiterated by Machida is that no printed circuit board is required in the Machida device (see col. 6, l. 61 and col. 7, ll. 49-50). As such, *Machida teaches against using such a circuit board*. Additionally, Machida is not concerned with heat generation by the LEDs, as evidenced by the suggested use of caulk, which is not known for its thermal conductance properties. As such, *Machida does not teach or suggest any modification or other consideration related to structure or materials for managing or channeling heat generated by the LEDs*. Further, the size and mounting arrangement of the Machida signal lamp is dictated by the body 4 and lens 2, which are generally quite bulky compared to the LEDs.

Machida does not teach all of the limitations of Claims 38-40. Thus, Machida does not anticipate these claims. Additionally, Machida does not teach or suggest all of the limitations of Claims 41-43, when these claims are considered as a whole. In fact, Machida teaches against some of the recited limitations. As such, Applicants respectfully request the Examiner to withdraw the rejections of these claims.

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Claims 1-37 have been allowed by the Examiner. Claim 1 has been amended to correct a typographical error noted by Applicants' counsel. However, the scope of Claim 1 has not been changed, and Claims 1-37 remain patentable.

All of these claims are currently believed to be in condition for allowance.

New Claims

New Claims 44-63 have been added to more thoroughly claim the subject matter that Applicant considers to be the invention. New Claims 44-46 depend from Claim 1, and New Claim 47 depends from Claim 38. New Claims 48, 54 and 59 are independent claims from which new Claims 49-53, 55-58, and 60-63 depend. All of the new claims recite patentable subject matter and are considered to be in condition for allowance.

CONCLUSION

For the foregoing reasons, it is respectfully submitted that the rejections and objections set forth in the outstanding Office Action are inapplicable to the present claims and specification. Accordingly, early issuance of a Notice of Allowance is most earnestly solicited.

The undersigned has made a good faith effort to respond to all of the rejections in the case and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if any issues require clarification, the Examiner is respectfully requested to call Applicant's attorney in order to resolve such issue promptly.

Respectfully submitted,

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Dated: 8/27/02

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

The specific changes to the amended claims are shown on these pages. Insertions are shown underlined while deletions are ~~struck through~~.

IN THE CLAIMS:

Claims 1 and 38 have been amended as follows:

1. (Amended) A light emitting diode (LED) module for mounting on a heat conducting surface that is substantially larger than the module, the module comprising:
 - a plurality of LED packages, each package comprising an LED and at least one lead; and
 - a circuit board, the circuit board comprising:
 - a thin dielectric sheet;
 - a plurality of electrically-conductive contacts on a first side of the dielectric sheet, each of said plurality of contacts being configured to mount a lead of an LED package such that said plurality of LEDs is series connected; and
 - a heat conductive plate on a second side of said sheet, said plate having a first side in thermal communication with the plurality of contacts through said dielectric sheet, said first side of said plate having a surface area substantially larger than a contact area between the contacts and the dielectric sheet, said plate having a second side adapted to provide thermal contact with the heat conducting surface, whereby heat is ~~transferred~~ transferred from the module to the heat conducting surface.
38. (Amended) A low profile modular lighting apparatus for conducting heat away from a light source of the apparatus and to a mounting surface, the apparatus comprising:
 - a plurality of light emitting diodes (LEDs); and
 - a circuit board comprising a thermally conductive main body and a plurality of electrically conductive contacts, each of the LEDs electrically communicating with at least one of the contacts in a manner so that the LEDs are configured in a series array; ~~each of the LEDs electrically communicating with corresponding contacts at an attachment area defined on each contact, an overall surface of the contact being substantially larger than the attachment area;~~

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wherein the plurality of contacts are arranged adjacent a first side of the main body and are in thermal communication with the first side of the main body, the main body electrically insulating the plurality of contacts relative to one another; and

wherein the circuit board is generally planar and a second side of the main body opposite the first side is generally flat to facilitate heat transfer from the main body to the mounting surface and so that the apparatus has a low profile upon the mounting surface.

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